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Plant Disease Outlook for 1963

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by Gayle L. Worf

The degree to which plant diseases may develop in 1963 and the amount of losses that may result will depend on several factors. These include the weather, growth stage of plants and presence or absence of disease causes.

PLANT DISEASES will flourish in Iowa's fields and gardens again in 1963. Last year there were outbreaks of several diseases of field and garden crops, and Dutch elm disease continued its march across the state.

In 1963, we'll see a continuation of many of these diseases. Just which diseases will prevail and the degree to which they'll develop depend on several factors. We'll point out these factors, and you can do your own predicting.

Disease Causes . . .

Years ago, people thought that plant troubles stemmed from bad weather and supernatural occurrences. When late blight caused the Irish potato famine in the 1840's, some people thought it was a result of the dismal, cloudy weather that had prevailed. Other folks believed that it was the work of the devil. But early scientists proved that the blight resulted from the activity of a microscopic fungus, a tiny plant that invaded the potato tissues and turned both vines and tubers into a putrid pulp. This was the first general recognition that "germs" caused plant diseases.

Actually, more is involved in disease incidence than just the presence of disease-causing germs. The cool, damp weather prevalent over Ireland *did* contribute to the disease development. Such weather conditions were necessary for the tiny fungus spores, or "seeds," to germinate and penetrate the potato plants. The spores probably had been present for some years, but the *weather conditions* ideal for disease development had been lacking.

A disease doesn't always appear, however, even when disease organisms are present and weather conditions seem suitable for germ development. The growing season was quite cool in some areas of Iowa last year, and at least some spores of the northern corn leaf blight fungus were present. Yet, no "epidemic" or epiphytotic developed. Why? Partly, because of the increased planting of hybrids resistant to the disease.

Plants vary in susceptibility to attack by various diseases. Part of a plant's disease resistance or susceptibility is inherited. A plant's susceptibility also changes with age and season. Corn, for example, becomes more susceptible to blight as it approaches maturity. Elms are more susceptible to Dutch elm disease early in the season than in August or September.

Timing, then, is another factor involved in disease incidence. The weather, the germs and the plants must be just right for a disease to develop. Because of nature's intricate requirements for a disease occurrence, it might seem that disease development would be unlikely. This isn't true, though, because more than 50,000 diseases do attack plants. Most diseases attack only specific plant species, but enough different types of organisms attack each crop with sufficient variation in their development requirements that some diseases occur each year.

Predictions . . .

How can disease outbreaks be predicted? Through the years, certain diseases have caused concern. We've learned the conditions that trigger them. If we know the conditions that cause diseases and what weather patterns to expect, we can predict disease possibilities. We issue potato late blight warnings each summer, for instance, when suitable temperature-moisture relationships exist for several consecutive days.

The table indicates some common plant diseases and the conditions that warn of their attack. Remember, the information in the table assumes that the disease organisms are present and that the plants are in a disease-susceptible condition.

Specific Diseases . . .

Several diseases were particularly bothersome in 1962. These deserve special attention as we consider prospects for 1963.

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Corn Leaf Blight: This disease appears sporadically in Iowa but was severe in 1960 and 1961. Some parts of the state suffered losses in 1962. All conditions were favorable for the disease last year, and the increased use of resistant corn hybrids probably helped to reduce the disease incidence. But we're not out of danger from recurrence of corn leaf blight.

Soybean Diseases: At least eight diseases reduced soybean yields in Iowa last year. Bacterial diseases were the most troublesome. Wet weather favors soybean pathogens and results in greater losses. The best chance for keeping losses to a minimum is to plant high-germinating seed from fields that yielded well last year. Plant in a well-prepared, warm and fairly dry seedbed and use a 3- to 4-year rotation. Drier weather in 1963 would reduce the incidence of diseases attacking soybeans, but weather will be important all summer.

Cereal Rust: After several years' absence, wheat stem rust returned last year to seriously reduce the yield and quality of wheat throughout the Midwest. Cool, late spring temperatures and heavy spore showers from southern states combined to produce the wheat stem rust outbreak. Oats weren't affected early enough to be much injured. Many new rust-resistant varieties of cereals have been released over the years to provide plant resistance to the most common races of rust as they have developed. But rust races change, and it's a constant struggle for plant breeders to cope with the new pathogens. If we do have early summer conditions similar to those of last year, we'll have rust again in 1963.

Dutch Elm Disease: This disease was reported for the first time in 12 more counties in 1962. These were Adair, Benton, Carroll, Cedar, Hamilton, Hardin, Jackson, Jefferson, Linn, Marshall, Plymouth and Van Buren. It's a safe prediction that we'll lose a greater number of elms in 1963 than in 1962. Community control programs, which include strict tree sanitation and dormant spray applications, offer the only proven means of saving trees. Where control programs aren't practiced you may want to underplant elms with other tree species so the elm tree loss won't be as great a shock.

Tomato Blights: Conditions were ideal last year for one of the most serious blight outbreaks in recent years. Continued wet weather plus a buildup of spores from previous years were responsible. Blight is a particular problem for gardeners who cannot

Possibilities and critical periods for some common plant diseases in 1963.

Crops	Diseases	Prevalence in Iowa in 1962	Conditions favoring disease	Critical periods
Field Crops:				
Alfalfa, clover	Foliage	**Heavy**	High humidity, delayed harvesting	Spring and fall
	Root and stem	Scattered	Local soil situation, susceptible varieties	All summer
Corn	Leaf blight	Moderate in south	Frequent, heavy dews; high moisture; temperatures at 60° F.-80° F.	July, August
	Stalk rot	Scattered	Corn plants suffering from stress	August to October
Oats	Rust	Moderate	Late planting, moderate temperatures, wet weather	June, July
	Yellow dwarf	Scattered	Wind movement of virus-carrying aphids	May, June
Soybeans	Seedling, foliage	**Heavy**	Wet season; cold, wet seedbeds	All summer
	Stem rot, stem canker	Scattered	Continuous cropping	Late summer
	Root rot	Moderate	Wet soil	All summer
Wheat	Rust	**Heavy**	Cool, wet, late spring; spore showers from southern states	June
Home and Garden Plants:				
Flowers	Foliage	**Heavy**	Wet weather, poor sanitation, crowded conditions	All summer
Tomatoes, potatoes	Late blight	Light	Continued cool, wet weather	Early, late summer
	Early blight, Septoria	**Heavy**	Warm, wet weather	Midsummer
Trees	Anthracnose	Scattered	Cool, wet spring	May-June
	Leaf spot	**Heavy**	Wet weather	Summer
	Dutch elm	12 more counties	Unpruned, unsprayed elms	May-July
Vine crops	Leaf spot, blight	Moderate	Wet weather	Summer
	Bacterial wilt	Moderate	Mild winters that permit survival of bacteria-carrying beetles.	Summer
Fruit Crops:				
Apples, pears	Scab	**Heavy**	Cool, wet spring and early summer	April-July
	Cedar-apple rust	**Locally heavy**	Alternate rain and sunshine, windy weather	May-June
	Fire blight	**Locally heavy**	Moderate temperatures, wet weather	May-June
Cherries	Cherry leaf spot	**Heavy**	Wet weather	May-August
Grapes	Downy mildew	**Heavy**	Moderate temperatures, wet weather	Late summer
Raspberries	Leaf, cane diseases	Moderate	Unpruned brambles, wet weather	Late summer
Strawberries	Leaf spot, fruit rot	**Heavy**	Wet weather	Spring, fall

grow tomatoes in new locations each year. Burning garden debris, rotation and an early, continuous spray program are the best means of control. If you had trouble with blight last year, start your fungicide program this year when the plants begin blooming — even though you can't see any blight at the time.

Disease Prevention . . .

An old adage is "Prepare for the worst and hope for the best." You can best prepare against disease loss in 1963 by observing the following precautions:

Use the best seed possible of adapted, disease-resistant varieties. Use certified seed and inspected transplants. Grow more than one variety.

Clean, test and treat all seed before planting.

Plant at recommended seeding dates in a well-prepared seedbed. Give the plants a chance to compete with the pathogens.

Don't plant root-rot sensitive crops on poorly drained soils.

Avoid unnecessary injury to roots and tops of plants.

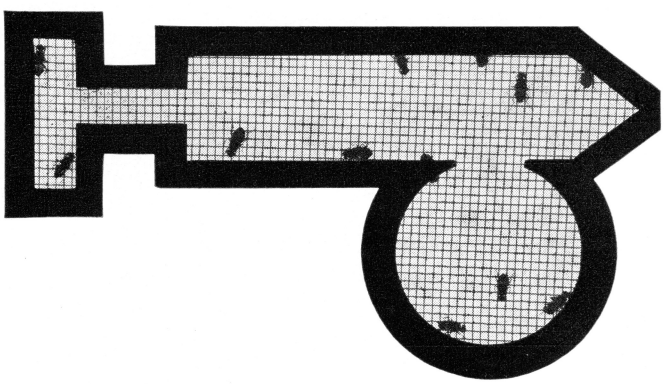
Follow recommended agronomic and horticultural practices for fertilization, cultivation and crop rotations.

Control insects and weeds. Insects carry many diseases; weeds harbor some crop diseases.

Use protective fungicides on disease-susceptible fruits, vegetables and ornamentals.

Follow a good sanitation program; plow under or burn garden debris.

Harvest crops carefully. Storage diseases often begin in bruises and injuries. Discard material that you suspect of having diseases; don't carry over last season's diseases.



Insect and Rodent Prospects for 1963

What insects will we have this year? We can expect heavy fly populations, and both 13-year and 17-year cicadas will invade areas of Iowa in late May. Other insect and rodent problems will depend on the weather.

by Harold Gunderson and H. J. Stockdale

INSECT and rodent populations in Iowa ranged from light to severe in 1962. What will they be in 1963? Let's briefly review some damage that these pests caused in 1962. Then we'll try to predict some likely insect and rodent problems in 1963. But keep in mind that weather conditions during the growing season pretty much determine the size of the insect problem in any given year.

Field Crop Insects . . .

Grasshoppers boiled out of the ground over two-thirds of Iowa during the hot, dry weeks in May (see map 1). Highest populations usually were in southeastern Iowa. But fields in Hardin and neighboring counties had up to 100 grasshoppers per square yard! Many farmers sprayed fencerows to protect adjacent crops. Some farmers used malathion, Dibrom or Diazinon to kill hoppers in hay fields and pastures used for dairy cows. Use of these chemicals avoided illegal residues of insecticides in milk. Other farmers cut their hay crops, then poisoned hoppers in fencerows.

Black cutworms destroyed three replantings of corn in some areas —"desperation" soybean plantings were made when corn replanting would have been too late. Cutworms hit 319,000 acres of bottomland and upland in 34 counties in the southern half of the state. Some farmers tried to control cutworms in young corn even into June, when the cutworms were working entirely below the ground surface. These attempts failed.

Corn borer populations were lighter than we expected in most of Iowa. As usual, however — even in years of low population — cornfields planted either very early or late were hit hard. The annual fall corn borer survey showed a state average of 64 percent of stalks infested with borers and 89 borers per 100 plants.

Livestock Insects . . .

Four kinds of insects are important cattle pests. These are

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